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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
RYMAN, DANIEL J	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/695,755	NELSON ET AL.	
	Examiner	Art Unit	
	Daniel J. Ryman	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) *1-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 1/10/2005 have been fully considered but they are not persuasive. On pages 7-8 of the Response, Applicant asserts that Gallagher does not disclose making a routing decision "based on header information that comes from header storage." Examiner, respectfully, disagrees.

2. Gallagher discloses that a "Frame Receiver 110 separates the frame header 54 from the data 56" where the frame header "is transferred to a Frame Header FIFO 114" (col. 7, lines 38-49). The frame header is then processed by a frame preprocessor 120 which "determines whether the D_ID field 76 of the frame header 54 corresponds to the node 24 . . . . In the event that the frame destination node specified in the header field 76 does not match that of the receiving node 24, a reject frame is routed back to the fabric" (col. 7, lines 53-63). Otherwise, "the Frame preprocessor 120 transfers the frame header 54 to the Receive Frame Manager 100" (col. 7, lines 53-63). Therefore, as broadly defined, a routing decision is based on the header information that comes from header storage since the frame preprocessor routes the frame either back to the switch fabric or to the Receive Frame Manager according to D_ID field located in the header information.

Claim Objections

3. Claims 1-18 are objected to because claims 1 and 9 disclose that the routing decision is based upon the header information *when the header information is still buffered.* In the disclosure, the routing decision is based on *a header read from the header buffer* (page 11, lines 28-30). For claim 1, Examiner suggests changing "making a routing decision for the first frame

based upon the header information stored in the header storage" to "making a routing decision for the first frame based upon the header information read from the header storage". A similar change should be made for claim 9. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, 7-9, 11-14, 19, 20, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Gallagher et al. (USPN 5,619,497).

6. Regarding claims 1, 9,19, 20, 23, Gallagher discloses a method and system comprising: receiving a plurality of frames (col. 5, lines 27-31, col. 18, lines 30-35); storing the frames in a receive buffer (col. 20, lines 46-53: Frame Data FIFO), wherein the receive buffer is configured to be accessed in a first-in-first-out fashion (col. 20, lines 46-53: Frame Data FIFO); storing header information corresponding to each of the frames in a header storage (col. 20, lines 46-53: Frame Header FIFO), wherein the header storage is configured to provide access to the header information in the same order as the frames (col. 20, line 40-col. 21 line 45: Receive Frame Manager controls movement of frame data and transfer of such data in response to the receipt of the respective frame header by the Receive Frame Manager. Therefore access to header information is provided in the same order as the frame data); retrieving header information from the header storage, wherein the header information corresponds to a first frame (col. 24, lines 51-52: D_ID, is located in the table. D-ID is destination ID from the header per col. 6 lines

29-66); making a routing decision for the first frame based upon the header information (col. 7, lines 38-63 and col. 24, lines 49-59: an identifier of the output port associated with the located D_ID table entry is read from the table by the control circuit 450); retrieving the first frame from the receive buffer (col. 24, lines 49-50: control circuit 450 receives the processed frame); and routing the first frame based upon the routing decision (col. 24, lines 54-59 and fig. 16: the control circuit 450 positions the switch 458 to connect to the output terminal 462 associated with the port on which the processed frame is to be transmitted).

7. Regarding claim 3, Gallagher teaches the limitation wherein routing the first frame comprises transmitting the first frame to the transmit buffer of a destination determined by the routing decision (col. 24 lines 49-67 and fig. 16 control circuit routes frame to selected transmit FIFO (buffer) 354 based on routing decision as noted for claim 1.

8. Regarding claims 7, 12, 13 and 14, Gallagher teaches the limitation wherein the receive buffer is a First-in-first-out (FIFO) buffer having a head position and a tail position, wherein entries are written to the tail position and are promoted through the FIFO buffer to the head position, and wherein retrieving the first frame from the receive butter comprises reading the frame at the head position (fig. 7b, fig, 8, and col. 12, lines 28-31: first frame 50a is stored first, head, then 50b, 50f, 50c, 50d and last data frame 50e is stored last, tail for FIFO and Memory, first element location reused - circular).

9. Regarding claims 8 and 11, Gallagher teaches the limitation further comprising providing a bypass circuit coupled to the header storage, wherein if no header information is available at the head of the header storage, the bypass circuit makes next-received header information immediately available (col. 23, lines 38-54: Frame Header FIFOs send empty/not empty signals

indicative of whether frame header has been received by respective FIFO; if yes, access that FIFO, conversely if not, then not).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 2, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. (USPN 5,619,497).

12. Regarding claims 2, 21, 22 Gallagher teaches the control circuit 450 may include a buffer (col. 24, lines 32-33). Gallagher does not explicitly teach the limitation to allow a routing decision to be made on a frame while the preceding frame is being routed; or wherein the first header information corresponds to a first frame in the receive buffer and wherein the transfer logic is configured to make the routing decision for the first frame prior to the first frame reaching a head position in the receive buffer; or wherein the first header information corresponds to a first frame in the receive buffer and wherein the transmit logic is configured to make the routing decision for the first frame while a preceding frame is being transferred from the receive buffer.

Pipelining is a well-known technique to improve performance to those skilled in the art of communications, as suggested for example, by Viswanadham (col. 6, lines 12-40: overlap/pipeline to improve performance). One skilled in the art of communications would see the advantage of using the buffer in the control circuit to allow the decision making and routing

to be pipelined so that the header can be processed ahead of the data frame while the preceding frame is being transferred to reduce the latency of the system and improve performance. It would have been obvious for one of ordinary skill in the art at the time of the invention to apply pipelining techniques to the system of Gallagher, with the motivation being to arrive at a system that improves performance.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. (US 5,619,497) as applied above to claims 1-3, 7-9, 11-14, and 19-23, and, in further view of Viswanadham et al. (US 6,424,659).

14. Regarding claim 4, Gallagher teaches a method and system of routing frame data using the frame header as noted for the claims above. Gallagher does not teach the limitation further comprising maintaining a timer corresponding to each header in the header storage. Viswanadham, in the analogous field of communications, teaches the use of a timer corresponding to each header in the header storage (col. 16, line 30-col. 19 line 35: Time to Live, TTL, captured in L3 Header Memory, TTL is checked, TTL error flag is generated if TTL is less than a threshold). One skilled in the art of communications would recognize the advantage of including a timer to identify stale data, as is normally the case in the art of data communications. It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Viswanadharn, to apply the timer feature to the system of Gallagher, with the motivation being to arrive at a system that improves performance by providing a timer to identify stale data.

15. Claim 5 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. and Viswanadham et al. as applied to claims 1-4, 7-9, 11-14, and 19-23 above,

and in further view of Comer (Douglas E. Comer, Internetworking with TCP/IP Vol. 1 Principles, Protocols, and Architecture, Prentice Hall, 3rd Edition, 1995, pg. 99).

16. Regarding claim 5, Gallagher teaches a method and system of routing frame data using the frame header as noted for the claims above. Viswanadham teaches the use of a timer and to generate an error if the TTL value crosses a threshold. These references do not teach the limitation of discarding the frame corresponding to the header information if the timer corresponding to the retrieved header information exceeds the predetermined maximum value.

Comer, in the analogous field of communications, teaches the limitation of discarding the frame corresponding to the header information if the timer corresponding to the retrieved header information exceeds the predetermined maximum value, as is normally the case in the art of data communications (p. 99). One skilled in the art of communications would recognize the advantage of a discard of the data if the timer crosses a threshold, as is normally the case in the art of data communications. It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Comer, to apply the discard feature to the system of Gallagher and Viswanadham, with the motivation being to arrive at a system that improves performance by discarding stale data.

17. Regarding claims 15-18, Gallagher and Viswanadham teach the use of a timer for the frame data and frame header buffers (Viswanadham: col. 17, lines 25-44)

18. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. and Viswanadham et al. and Comer as applied to claims 1-5, 7-9, 11-14, and 19-23 above, and in further view of Darnell et al. (US 6,317,415).

19. Regarding claims 6 and 10, Gallagher teaches a method and system of routing frame data using the frame header as noted for the claims above. Viswanadham teaches the use of a timer and to generate an error if the TTL value crosses a threshold as noted for the claims above. Comer teaches discarding the frame if the TTL exceeds a predetermined value. These references do not teach the limitation further comprising snooping on received frames to identify the header information corresponding to each of the frames.

Darnell, in the analogous field of communications, teaches the use of a snoop circuit for snooping on received frames to identify the header information corresponding to each of the frames (col. 5, lines 20-43 and fig. 5: Snooper 120: IRC 40 snoops on the data bus to determine the frame pointer value and the header information of the received packet). One skilled in the art of communications would recognize the advantage of a snoop circuit to identify header information efficiently. It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Darnell, to apply the snooper to the system of Gallagher, Viswanadham and Comer, with the motivation being to arrive at a system that improves performance by monitoring the data in parallel with other operations to determine the header.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nichols et al. (US 4,977,582) and Sang et al. (US 6,577,636) disclose routing/forwarding systems that include storing frame header information.

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 7:00-4:30 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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